NOTE IX.

ON A LARGE *PENELLA*-SPECIES FROM THE MOLUCCAS

BY

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(With 3 figures).

Mr. J. W. van Nouhuys, Commander of the Government-Marine in Dutch India, presented to the Leyden Museum some pieces of the skin of a big fish (Selachian?), caught in the Moluccas, that are beset with several specimens of a large *Penella*; in like manner upon different points of the body of these parasites, individuals of the well-known Cirripede *Conchoderma virgatum* Spengl. have fixed themselves. It is not an easy task to state to what species of *Penella* our specimens may belong, for though Steenstrup and Lütken [1]) have given us a detailed description and exact figures of four species of this genus, viz. *P. sagitta*, *varians*, *exocoeti* and *crassicornis*, and afterwards Koren and Danielssen published a rather elaborate paper on a *Penella* from *Balaenoptera rostrata* [2]), there reigns as yet a good deal of uncertainty about the specific characters of several other described specimens; moreover, as remarked by the first-named authors in their description of *P. varians* [3]) »we know not

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1) Bidrag til kundskab om det aabne Havs Snyltekrebs etc.: Kongel. Danske vidensk. Selskabs Skriften, 5e raekke, nat. og math. Afd. 5e bind, 1861, p. 408; to the kindness of Miss Annie Jentink I owe a translation of this paper.

2) Fauna littoralis Norvegiae, Hft. 3, 1877, p. 157, pl. XVI, figs. 1—9.

3) loc. cit. p. 414. This parasite was found upon a fish, *Coryphaena* sp.,

at all how much the parasites of this genus are liable to an important variation in form, when the chance guides them upon one fish or the other and when they fix themselves into the soft flesh or under such unfavourable conditions, as apparently presented by the fins." In the catalogue of Parasitic Copepoda found on fishes, published in 1899 by Mr. Bassett-Smith [1]) only six species are recorded, but the number of specific names mentioned in the Zoological litterature, undoubtedly is twice as great, their diagnoses however being often so indefinite, that it is impossible to recognize the species referred to. I therefore think it the best to describe our specimens as accurately as possible and to compare them with the well-known species. If a later examination may prove that they represent a new species, I propose to call it *P. Nouhuysii* in honour of the amateur-naturalist, who enriched our collections with several interesting specimens.

The largest female specimen (no males are observed) has a length of about 170 mm., its cephalothorax measuring nearly 80 mm., its genital segment 60 mm., and the abdomen 30 mm. It is the greatest length of a *Penella*-species hitherto recorded from a fish, for *P. histiophori* Thomson [2]), found upon *Histiophorus Herscheli*, measures only 90 mm.; those living on warmblooded animals appear to be larger, for the not quite full-grown specimens of *P. crassicornis* St. L. (a parasite of *Hyperoodon rostratus*) have a length of 80 to 100 mm. and the specimens of *Penella balaenopterae*, described by Koren and Danielssen had the enormous length of 300 to 320 mm. According to Messrs. Anthony and Calvet, a *Balaenoptera physalus*, caught at Cette in October 1904, bore on the flanks of its body several *Penella*-specimens, 100 to 150

often called „Dolphin" by the seamen; misled by that name Messrs. Anthony and Calvet (Bullet. Mus. d'Hist. Nat. 1905) thought that it was met with upon a cetaceous mammal, belonging to the genus *Delphinus*.

1) Proc. Zool. Soc. 1899, p. 482.

2) Trans. N. Z. Inst. Vol. XXII, 1889, p. 368, pl. XXVIII, fig. 2.

mm. in length, that were deeply fixed within the blubber of the animal [1]).

The head is swollen, globous, nearly twice as broad as the neck; its frontal side is faintly concave, with a shallow longitudinal groove in the middle and is furnished with the well-known branched protuberances, that are however much less developed as in other species f. i. in *P. sagitta*, *varians* and *exocoeti*, where they are projecting a good deal beyond the surface of the head. Two long and slender arm-like processes are emerging from the posterior end of the head, with a very acute angle; they are half as thick as the neck and have a length of 18 mm., measuring therefore nearly a tenth of the total length of the animal. In most *Penella*-species the arm-like processes are short and obtuse, projecting from the body nearly with a right angle, in the small *P. sagitta* however they are very long, directed posteriorly and reaching a third of the total length of the body. In none of our specimens I could detect a trace of a third arm-like process, like it occurs in *P. varians* and *P. crassicornis*; *P. histiophori* also appears to possess a third rudimentary arm, for Thomson says: »between them (the arms) and projecting a little posteriorly is a rounded protuberance", though he failed to mention if it is placed dorsally or ventrally. However there cannot be looked on the presence or absence of this third process as a character of much importance, since Steenstrup and Lütken, examining nine adult specimens of *P. varians*, stated that in four of them three arm-like processes occurred, whereas in the five others there were only two.

Upon the dorsal side of the head, not far from the frontal margin, two pairs of antennae are situated. The anterior of them (fig. 2) are two-jointed, consisting of a short apical joint and a long basal one, though I believe, that in the middle of the last one also an articulation is

1) loc. cit. p 198.

recognizable. The apical joint bears five short setae and is moreover provided in the left antenna with a long bristle; the basal joint is furnished with a row of several stout setae. The posterior anteunae consist of a short and broad basal joint and the claw-shaped terminal one; they agree in all regards with those of *P. varians*, figured by Steenstrup and Lütken [1]). In the middle-line between the antennae a spot of black pigment indicates the place of the unpaired eye. At the ventral side of the body the four pairs of swimming feet are recognizable (fig. 3). The two anterior pairs of them, lying close behind each other, are situated nearly in the same line with the base of the arm-like processes; the third pair however does not follow directly but is separated from the preceding one by a distance of $1^1/_2$ mm., as is also the case with the fourth pair. The two feet of the last-named pair are separated by a distance twice as large as that between the feet of the preceding pairs. *P. crassicornis* also has the pairs of swimming feet situated on a certain distance from each other; nevertheless they seem to be arranged on an other manner as in our species; in *P. sagitta*, *varians* and *exocoeti* the pairs of swimming feet appear to be placed closely behind each other. The basal joints of both anterior pairs are trapezoidal, those of the two posterior pairs more triangularly shaped; they have all in their middle an irregular spot of dark-brown pigment. The first pair of feet is furnished with single-jointed branches of a roundish shape and only the right one of them bears two branches, whereas the left foot has lost its outer branch; the basal joint bears a bristle at the exterior and the interior side of the branches. The second pair has both feet single-branched, the outer branch being lost and substituted by a spine. Of the third pair only the right foot is furnished with a two-jointed branch; its distal joint bears six long setae, the terminal part of which however

1) loc. cit. pl. XIV, fig. 32.

is lost. The feet of the fourth pair do not show any branch and their basal joint is only furnished at their distal part with an obtuse spine. According to Steenstrup and Lütken in the young forms of *P. varians* the two anterior pairs of swimming feet are provided with two

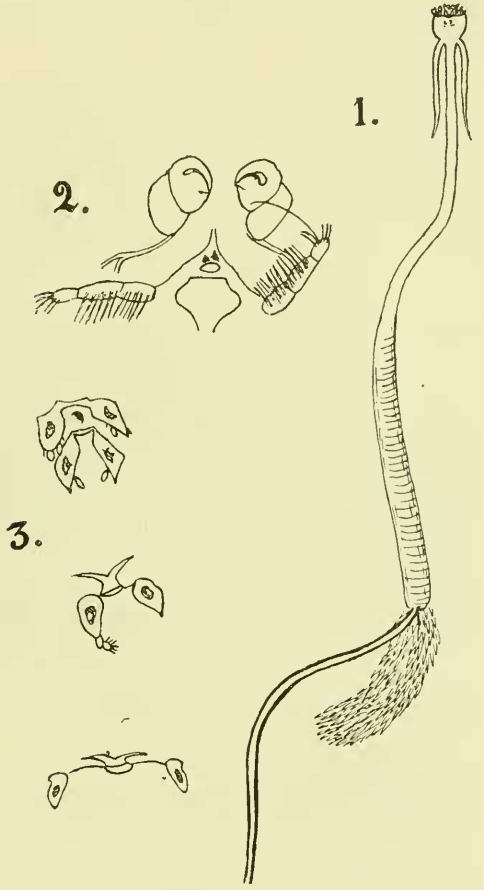

Fig. 1. Female *Penella*, about $\frac{1}{3}$ of its natural size.
Fig. 2. The antennae. × 36 diam.
Fig. 3. The swimming-feet in their natural position. × 15 diam.

two-jointed branches, whereas both posterior pairs only bear one two-jointed branch.

The region of the body succeeding the head, the so-called neck, that for its greater part is hidden within the flesh of the fish, is unsegmented, smooth; the surface of the genital segment however is wrinkled and furnished with faint annular grooves and small tubercles. In *P. filosa*, found upon *Xiphias gladius*, these wrinkles appear to be extraordinarily developed, according to the figures of Boccone [1]) and Guérin [2]).

Behind the genital apertures the abdomen is fringed on both sides with a row of twenty-one pale violet tufts of filaments, the last of which extend beyond the extremity of the body. Those abdominal tufts consist of more than 25 filaments of different length, and much agree with those of *P. filosa* and *crassicornis*, figured by Steenstrup and Lütken. Among these large filament-tufts we find on several places a smaller thread, that is single or only bifurcated; also in front of the genital apertures some small unbranched filaments are to be found. In *P. sagitta*, *exocoeti* and *varians* all the abdominal filaments appear to be entirely unbranched or only bifurcated. Dorsally, on a short distance from the bases of the abdominal tufts, there is a row of irregularly-shaped tubercles, ordinarily placed in couples next to each other.

There are two long egg-strings, exceeding the body in length.

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1) Recherches et observations naturelles, 1674, pl. 287, fig. DA.

2) Iconographie du Règne animal de Cuvier, 1829—44. Zoophytes, pl. IX, fig 3.